UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,498	04/19/2001	Thomas J. Sonderman	2000.067300	8900

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ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 10/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	09/838,498	SONDERMAN ET AL.
	Examiner	Art Unit	
	Douglas W Owens	2811	

-- The MAILING DATE of this communication app ars on the cover she t with th correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _03 October 2003_ .

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-55_ is/are pending in the application.

    4a) Of the above claim(s) _19-22, 24-41 and 48-55_ is/are withdrawn from consideration.

5)☒ Claim(s) _23_ is/are allowed.

6)☒ Claim(s) _1-10, 14, 15, 18, 42, 43 and 45-47_ is/are rejected.

7)☒ Claim(s) _11-13, 16, 17 and 44_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____ .

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
          application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)	4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5)☐ Notice of Informal Patent Application (PTO-152)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .	6)☐ Other: .

DETAILED ACTION

Claim Objections

1.   Claims 11 – 13 and 44 are objected to because of the following informalities:

Claims 11 and 44 recite the limitation "...said acquired model...". There is insufficient

antecedent basis for this limitation in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.   Claims 1 – 3, 7, 9, 10, 14, 15, 18, 42, 43 and 45 – 47 are rejected under 35

U.S.C. 102(e) as being anticipated by US patent No. 6,581,029 to Fischer.

Regarding claims 1 and 42, Fischer teaches a method (Col. 1, lines 28 – 59),

comprising:

defining a process task (Col. 1, lines 27 and 28);

performing a process simulation function to produce simulation data

corresponding to said process task, said process simulation comprising:

preparing at least one processing model;

executing a simulation to generate a simulation result;

determining whether said simulation result is within a predetermined
specification; and

interfacing said simulation data with a process control environment for controlling
a manufacturing process of a semiconductor device (Col. 1, lines 47 – 52, the
simulation data is used to produce a device).

Regarding claim 2, Fischer teaches a method, further comprising performing a
manufacturing process of the semiconductor device based upon said interfacing the
simulation data with the process control environment.

Regarding claim 3, Fischer teaches a method, wherein performing the
manufacture process would have inherently included processing a semiconductor wafer
since a semiconductor wafer is required for the manufacture of semiconductor devices.

Regarding claim 7, Fischer teaches a method, wherein defining a process task
further comprises defining an implant process task (Col. 1, lines 47 – 49).

Regarding claim 9, Fischer teaches a method, wherein performing a process
simulation function further comprises:

preparing at least one processing model for simulation (Col. 1, lines 54 – 59);

executing a simulation using said processing model to generate a simulation
result;

determining whether said simulation result is within a predetermined specification
(Col. 1, lines 50 – 53); and

applying said simulation result into at least one manufacturing parameter in

response to a determination that said simulation result is within said predetermined

specification.

Regarding claim 10, Fischer teaches a method, further comprising modifying said

model in response to a determination that said simulation result is not within said

predetermined specification (Col. 1, lines 54 – 59).

Regarding claims 14 and 47, Fischer teaches a method, wherein executing the

simulation further comprises:

modulating at least one variable;

executing a model behavior based upon said variable;

determining at least one component of variation based upon said execution of

the model behavior; and

determining whether said at least one component of variation is within a

predetermined specification (Col. 1, lines 46 – 54).

Regarding claim 15, Fischer teaches a method, wherein modulating at least one

variable further comprises modulating a temperature component (Col. 1, lines 47 – 50).

Regarding claim 18, Fischer teaches a method, wherein applying said simulation

results into at least one manufacturing parameter further comprises modifying at least

one manufacturing control parameter based upon said simulation result.

Regarding claim 43, Fischer teaches a method, further comprising modifying the

model in response to a determination that the simulation result is not within the

predetermined specification.

Regarding claim 45, Fischer teaches a method, wherein defining the processing

model further comprising defining a process model.

Regarding claim 46, Fischer teaches a method, wherein validating the defined

model further comprises integrating a plurality of defined models into a simulation

environment.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 4 – 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Fischer.

Regarding claims 4 – 6 and 8, Fischer does not explicitly teach a method,

wherein defining a process task comprises defining a photolithography, etch, chemical-

mechanical polishing and diffusion process task. Fischer teaches a method, wherein

the process tasks involved in forming a semiconductor device, such as a transistor, are

simulated. It would have been obvious to one of ordinary skill in the art to include a

photolithography, etch, chemical-mechanical polishing and diffusion task, since each of

these tasks are required in the formation of a transistor.

Allowable Subject Matter

6.   Claims 16 and 17 are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

7.   Linking claim 23 is allowed. Since the restriction requirement between inventions

I, II, III and IV, as set forth in Paper No. 3 mailed on March 13, 2003, was conditioned

on the nonallowance of the linking claim(s), **the restriction requirement as to the**

linked inventions is hereby withdrawn. Claim 23, previously withdrawn from

consideration as a result of the restriction requirement, the claim is hereby rejoined and

fully examined for patentability under 37 CFR 1.104. In view of the withdrawal of the

restriction requirement as to the linked inventions, applicant(s) are advised that if any

claim(s) depending from or including all the limitations of the allowable linking claim(s)

be presented in a continuation or divisional application, such claims may be subject to

provisional statutory and/or nonstatutory double patenting rejections over the claims of

the instant application. Once the restriction requirement is withdrawn, the provisions of

35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 44 F.2d 1211, 1215, 170

USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

8.   The following is a statement of reasons for the indication of allowable subject

matter: The prior art of record does not teach, alone or in combination, an apparatus as

cited in claim 23, particularly including means for interfacing the simulation data with a

process control environment.

Response to Arguments

9.   Applicant's arguments filed August 4, 2003 have been fully considered but they

are not persuasive.

The Applicant argues that Fischer does not teach performing process simulations

to produce simulation data and interfacing the simulation data with a process control

environment for controlling the manufacturing process of a device. In lines 34 – 37,

Fischer explains that "...In the TCAD system, designers create simulation control

"recipes", which are computer-executable scripts defining a set of process steps *to be*

performed by a simulation processor..." (emphasis added). Fischer further discloses

that the goal of the simulation is to arrive at optimization of variables "...so as to

produce a device with desired or optimal electrical properties..." (See Col. 1, lines 51

and 52). In the step of simulating manufacture of the device, simulation data such as

anneal times, temperatures, mask layout, implantation dosage, etc. are optimized (Col.

1, lines 45 – 50). Since the purpose of simulating the manufacture is to optimize the

variables for manufacture of an actual device, the simulation data would have inherently

been interfaced with the process control environment, wherein the process control

environment includes simulation data, such as temperature and anneal times.

The Applicant argues that it would not have been obvious to one of ordinary skill

in the art to also simulate the process steps of photolithography, etch, CMP and

diffusion. Fischer teaches that process steps used in the actual manufacture of

semiconductor devices are simulated (Col. 1, lines 45 – 47). The steps including

photolithography, etch, CMP and diffusion are absolutely necessary in the manufacture

of semiconductor devices. One having ordinary skill in the art would have included

necessary simulation steps for simulating the process steps of an actual device.

Conclusion

10.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Douglas W Owens whose telephone number is 703-

308-6167. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Eddie C Lee can be reached on 703-308-1690. The fax phone number for

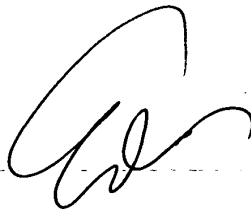the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is 703-305-

3900.

DWO

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800